900V 25A N-Channel Enhancement Mode Power MOSFET

Description

The AKT25N90L is an N-Channel enhancement mode power MOSFET which using proprietary planar stripe and DMOS technology.
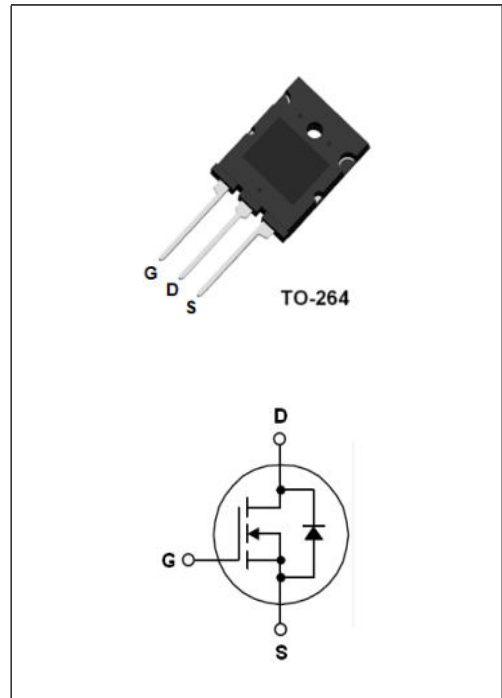
This MOSFET has low static on-resistance and high avalanche energy strength. This device provide excellent performance for high voltage power supplies or pulse circuits.

Features

• Typical on-Resistance: $R_{DS\,(on)}$=0.34Ω

• High Blocking Voltage

• 100% Avalanche Test

• Good Stability and Uniformity with High E_{AS}

Applications

• High Voltage Power Supplies

• Capacitor Discharge Applications

• Pulse Circuits

TO-264

Absolute Maximum Ratings @T_C=25 ℃ unless otherwise noted

Symbol	Parameter		Ratings	Unit
V_{DSS}	Drain to Source Voltage		900	V
V_{GSS}	Gate to Source Voltage		$\pm$30	V
I_D	Drain Current	T_C=25℃	25	A
		T_C=100℃	16	A
I_{DM}	Pulsed Drain Current (Note1)		100	A
P_D	Maximum Power Dissipation	T_C=25℃	500	W
	Derate above 25℃		4	W/℃
E_{AS}	Single Pulsed Avalanche Energy (Note 2)		1800	mJ
T_J	Operating Junction Temperature Range		-50~+150	℃
T_{STG}	Storage Temperature Range		-50~+150	℃

Thermal Characteristics

Symbol	Parameter	Ratings	Unit
$R_{th\,(J-C)}$	Thermal Resistance, Junction to case	0.25	℃/W
$R_{th\,(J-A)}$	Thermal Resistance, Junction to Ambient	40	℃/W

Electrical Characteristics @T_C=25 ℃ unless otherwise noted

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV$_{DSS}$	Drain to Source Breakdown Voltage	V$_{GS}$=0V, I$_D$=250uA	-	950	-	V
V$_{GS(th)}$	Gate Threshold Voltage	V$_{DS}$=V$_{GS}$, I$_D$=250uA	3.2	3.9	4.6	V
R$_{DS(on)}$	Static Drain-Source On-Resistance	V$_{GS}$=10V, I$_D$=12.5A	-	0.34	-	Ω
I$_{DSS}$	Zero Gate Voltage Drain Current	V$_{DS}$=V$_{DSS}$, V$_{GS}$=0V	-	-	1	uA
I$_{GSS}$	Gate to Source Leakage Current	V$_{GS}$=V$_{GSS}$, V$_{DS}$=0V	-	-	±100	nA

D-S Diode Characteristics and Maximum Rating @T_C=25 ℃ unless otherwise noted

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I$_S$	Maximum Drain to Source Diode Forward Current		-	-	25	A
V$_{SD}$	Drain-Source Diode Forward Voltage	V$_{GS}$=0V, I$_S$=25A	-	0.89	1.1	V
t$_{rr}$	Reverse Recovery Time	V$_{GS}$=0V, I$_S$=25A, di/dt=-100A/us	-	-	400	ns
Q$_{rr}$	Reverse Recovery Charge		-	-	7	uC

Switching Characteristics @T_C=25 ℃ unless otherwise noted

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
t$_{d(on)}$	Turn-on Delay Time	I$_D$=25A , V$_{DD}$=450V, R$_G$=10Ω (Note 3)	-	25	-	ns
t$_r$	Rising Time		-	15	-	ns
t$_{d(off)}$	Turn-off Delay Time		-	50	-	ns
t$_f$	Falling Time		-	15	-	ns
C$_{iss}$	Input Capacitance	V$_{GS}$=0V, V$_{DS}$=25V, f=1.0MHz	-	7600	-	pF
C$_{oss}$	Output Capacitance		-	1250	-	pF
C$_{rss}$	Reverse Transfer Capacitance		-	570	-	pF
Q$_g$	Total Gate Charge	I$_D$=25A, V$_{DD}$=720V V$_{GS}$=10V (Note 3)	-	52	-	nC
Q$_{gs}$	Gate to Source Charge		-	12	-	nC
Q$_{gd}$	Gate to Drain Charge		-	21	-	nC

Note:

1. Repetitive rating: pulse-width limited by maximum junction temperature

2. V$_{DD}$=100V, L=10mH, V$_G$=10V, I$_D$=20A

3. Essentially independent of operating temperature typical characteristics

Typical Performance Characteristics
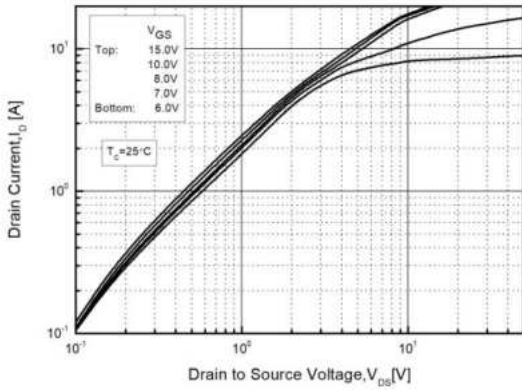
Fig. 1. Typical on-Resistance Characteristics

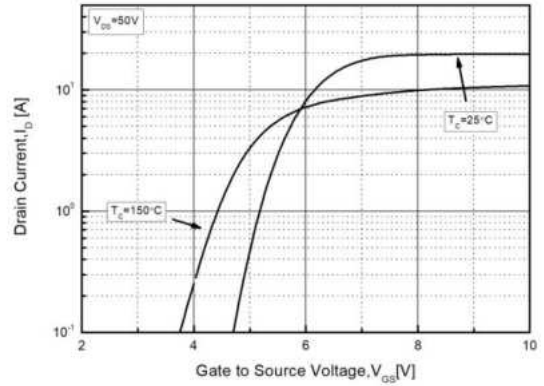Fig. 2. Typical Transfer Characteristics
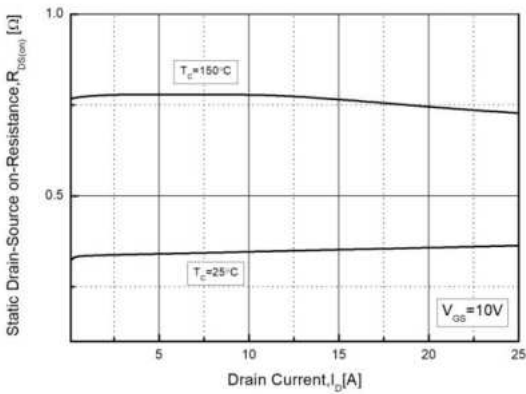
Fig. 3. Static on-Resistance vs. I_D

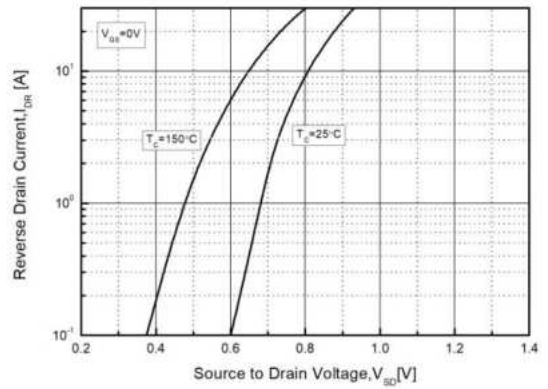Fig. 4. Body Diode Forward Voltage vs. I_{DR}
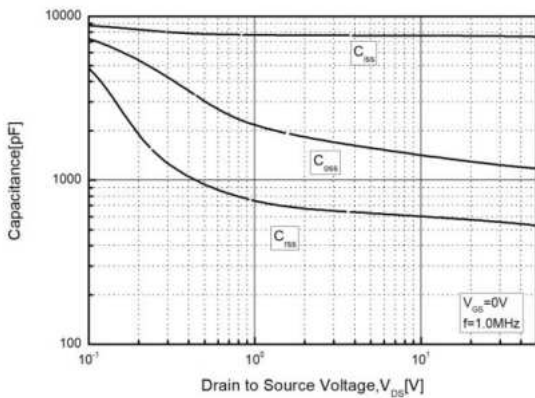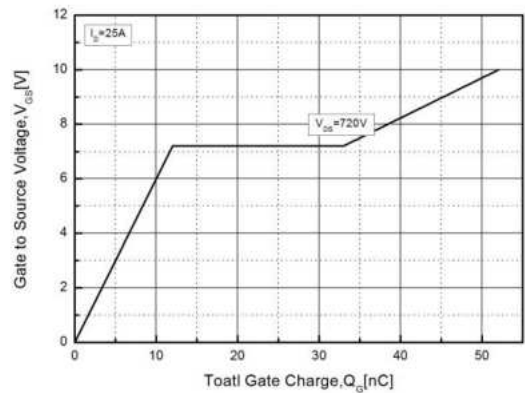
Fig. 5. Capacitance Characteristics

Fig. 6. Gate Charge Characteristics

Typical Performance Characteristics

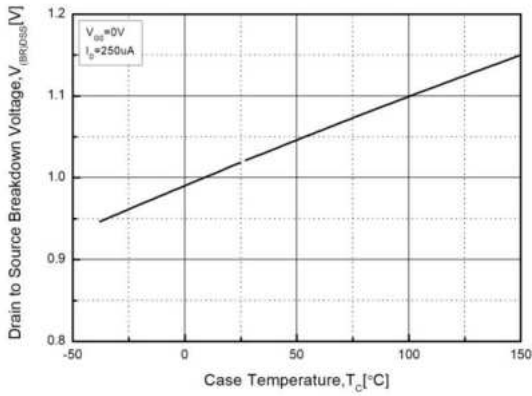Fig. 7. Breakdown Voltage vs. Temperature

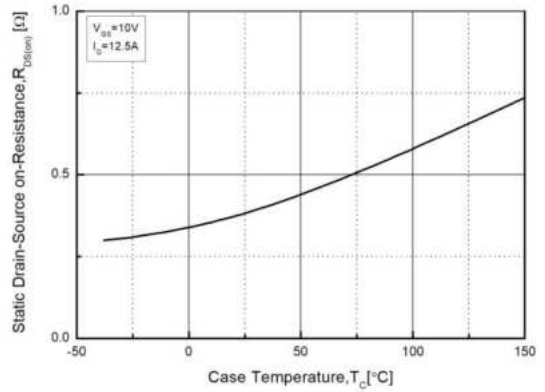Fig. 8. Static on-Resistance vs. Temperature
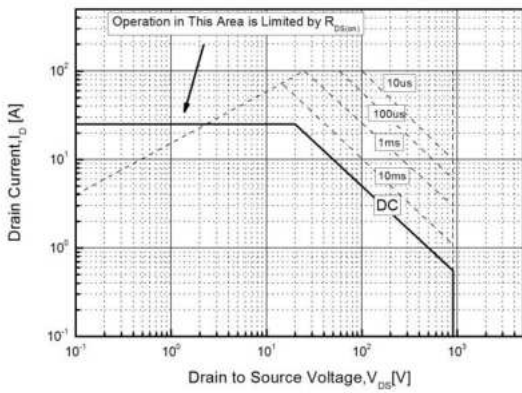

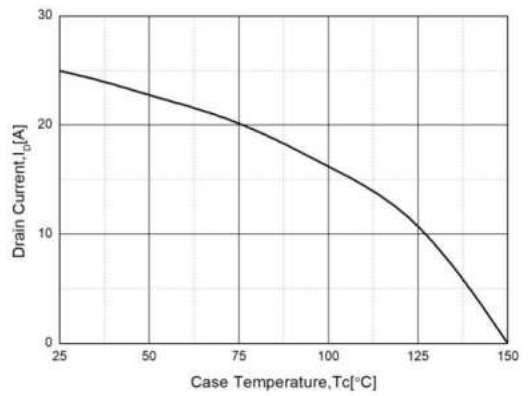Fig. 9. Safe Operating Area

Fig. 10. Maximum Drain Current vs. Temperature

Fig. 11. Transient Thermal Response Curve

Package Dimensions

TO-264

(Dimensions in Millimeters)